

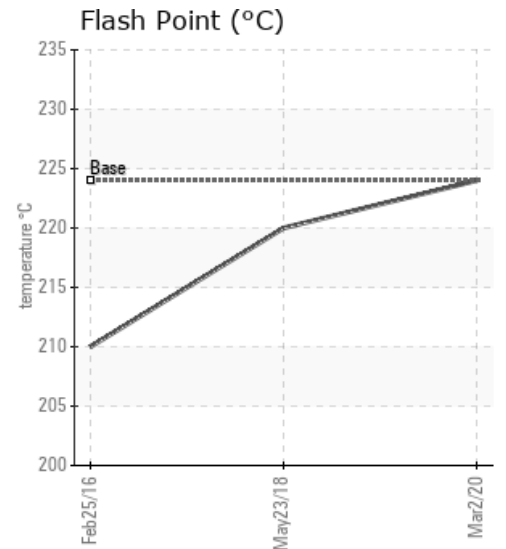
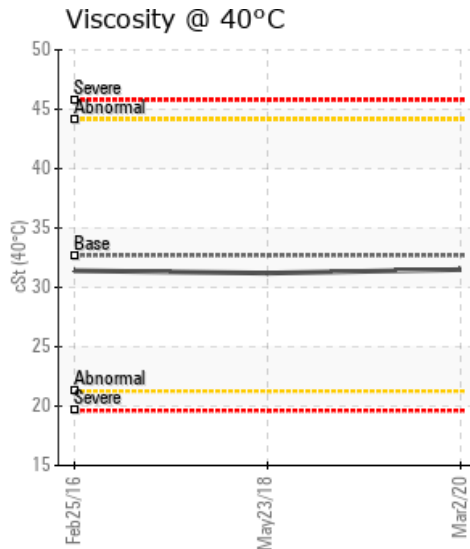
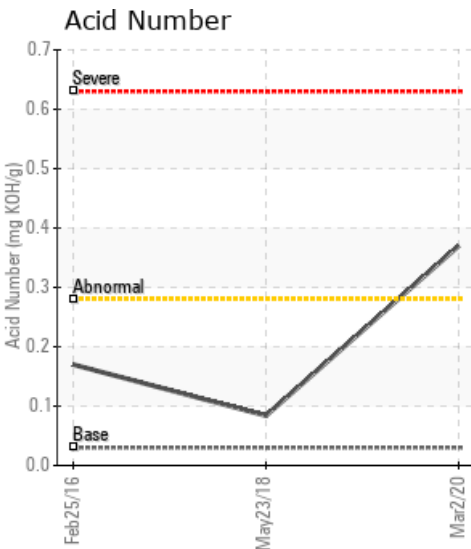
250/500 HOT OIL VESSEL

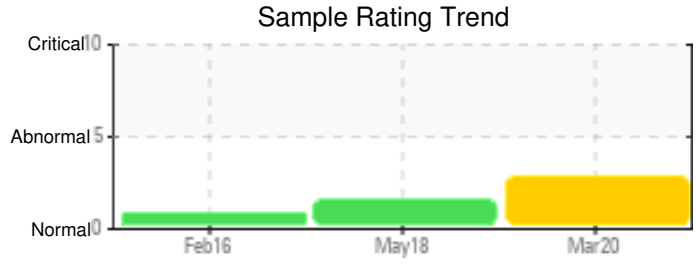
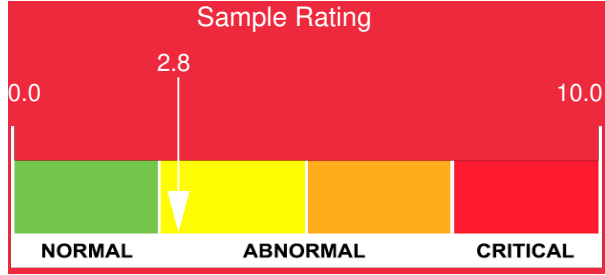
Customer: PTRHTF10039	System Information	Sample Information
Piedmont Chemical Industries 331 BURTON AVE. HIGH POINT, NC 27261 USA Attn: BOB BURGES Tel: (336)885-5131 E-Mail: bburgess@piedmontchemical.com	System Volume: 250 gal Bulk Operating Temp: 554F / 290C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make:	Lab No: 02341647 Analyst: Manny Garcia Sample Date: 03/02/20 Received Date: 03/05/20 Completed: 03/11/20 Manny Garcia manuel.garcia@petrocanadalsp.com

Recommendation: Acid number is high and not a value that can be mitigated easily. This is a chemical change in structure of the fluid & consideration for a system oil change and flush is recommended considering the fluid is 20 years old and the system volume is only 250 gallons.

Comments: Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.

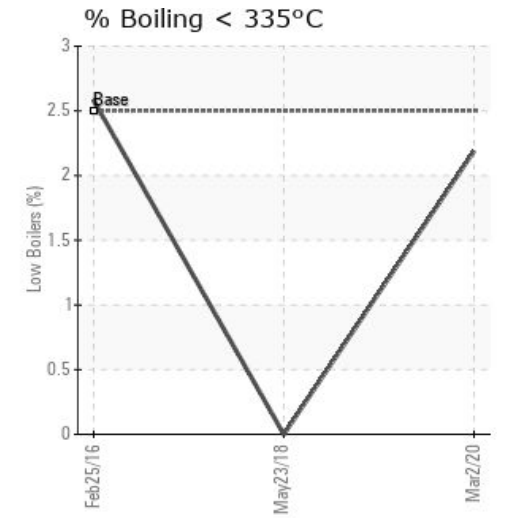
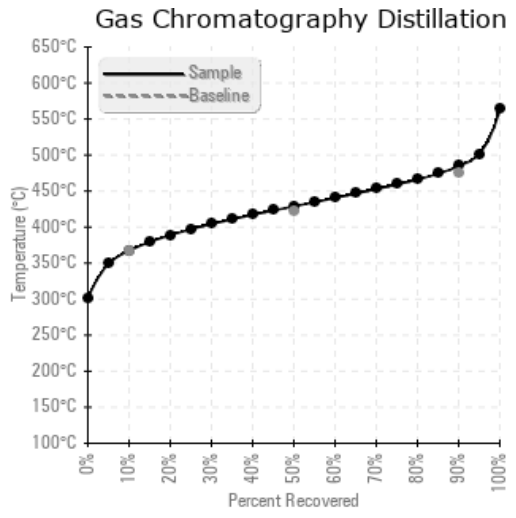
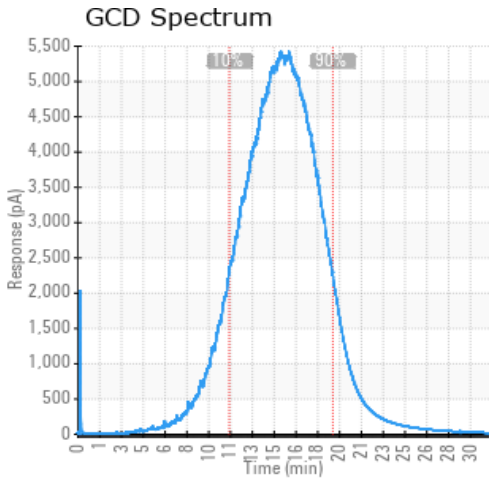
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/02/20	03/05/20	20y	PUMP	435 / 224	12.0	31.5	0.370	0.637	693 / 367	804 / 429	904 / 485	2.19
05/23/18	06/05/18	12y		428 / 220	17.9	31.2	0.084	0.700	681 / 361	773 / 412	901 / 483	0.00
02/25/16	03/02/16	10y	HEATER UNIT	410 / 210	16.6	31.4	0.17	0.509	687 / 364	790 / 421	890 / 476	2.58
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5





Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
03/02/20	91	0	2	0	2	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	206	0
05/23/18	81	0	1	0	2	0	0	0	0	0	3	1	0	0	0	0	0	0	0	1	0	0	210	0
02/25/16	100	0	2	0	2	0	0	0	0	0	4	2	0	0	0	0	1	0	0	0	0	0	218	0
Baseline Data			0	0						0		0	0					0					270	

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments

05/23/18	Fluid is suitable for continued use. Please submit the next sample in May, 2019 Pentane Insolubles levels are severely high. Very light debris seen by the chemist. Filtering the fluid and/or changing any system filters is recommended during a safe timeframe.
02/25/16	Oil condition is very good after 10 years of Operation. Recommend the fluid be run thru appx 5-10 micron filtration during next opportunity (shut-down) to clean up the solids/metals/debris in the fluid. Continue Use Wear Metals are low; Contaminants are low; Additives are satisfactory; Water is nil; Total Acid number is low; Viscosity is very good; Flash Point is good; Distillation points are acceptable at all levels; pentane solids are high; White Metal and debris visible/light in the sample

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